Notebook Series -- Notebooks by Experimenters Other Than Edison
Navy and Wartime Research Experiments -- A. M. Kennedy Books
Notebook, N-17-04-01

This notebook was used by Absalom M. Kennedy in May and August 1917 for notes on experimental work for the U.S. Navy performed under the direction of Edison during World War I. The entries from May relate to the procurement of a boat at Cold Spring Harbor, Long Island, setting it up for experimental work at Sandy Hook, New Jersey, and performing receiver and transmitter experiments. The entries from August pertain to experiments on the submarine detector. Included are details of trips to Sag Harbor, Long Island, to listen to torpedoes being fired at Bliss Proving Ground and other locations. The Bliss entries bear brief notations by Edison. The notes indicate that Jerry T. Chesler, E. Rowland Dawson, John A. Hanley, and Sherwood T. (Sam) Moore also worked on these experiments. The front cover is labeled "Experiments. #4. From May 1 to 1917." The pages are unnumbered. Approximately 110 pages have been used.

May 1, 1917.

Weather - Raining. High wind, blowing gale.

Ran down to Highlands. Found wind so high and so engine was skipping, ran back to Red Bank, agreeing to pay Andy $8.33 for day.

① Had Taylor fix #4 transmitter. (Small Dunner Bee) with heavy gravity clapper.

② Tested storage batteries, showing Dawson method and results. Found one discharged.

③ Tested lead covered cable as input against regular rubber covered wire. Found no difference.

④ Made arrangements with Irwin to store extra material and for use of lathes and

bench.

(5) Went over audions and showed Dawson effects of amount of filament current.

May 2, 1917.

Beautiful clear morning.

① Had Andy run tender off dock to get photographs of manos. Sun low & in good position but am afraid that the other (mind) manos interfere.

River very calm at Highlands. On entering bay, met by strong N.W. gale, throwing up heavy sea with white caps.

Anchored off breakwater. Wind increased. Started back up river to get readings.

Found water calm though high tide running between Highlands and mouth of Navesink River. Anchored to by effect of diaphragms.

As this tide would interfere with boom work, decided to try experiments with different thicknesses of diaphragms.

First tried using #3 Transmitter with horn from boom. Tide made this so noisy decided it was impracticable.

Then tried mounting #3 Transmitter with horn on tripod. Noise proved intermittent, at times perfectly quiet and then noisy.

Started out to find source of noise and located in ropes and cables touching or hitting the funnel.

With care to avoid this the transmitter was quiet.

Being at anchor between Bridge to Highlands and the mouth of the Navesink River, about 700 yds from mouth made tests of diaphragms.

(48) Transmitter #4
(Small Dinner Bell)
Receiver #3 with horn, on tripod.
Distance 300 yards

.010" diaphragm	Low	18
	High	34
.020" diaphragm	Low	28
	High	50
.032" diaphragm	Low	24
	High	38

Steamers came by and as the channel here is narrow, we had to move out of the way.
Came up to Red Bank and repeated experiment
Distance 100 yards

	Low
.032" diaphragm	8
.020" "	26
.010" "	12

May 3, 1917.

Weather. Fair. High West wind - Ran to Highlands to take diaphragm thickness readings.

Launched #3 Reason from room.

(49)

		Low	High
.010	none 48	16	38
.015"	none 48	24	50
.020"	" 42	42	60
.025"	" 30	32	48
.032"	" 46	28	40
.040"	" 24	12	26
.063"	" 22	12	20

May 11, 1917.

Weather - Morning - fair - high N.W. winds
Afternoon - cloudy.
wind moderated some.

On account of high wind, went to Highlands to take readings.
On first arrived, tide was so swift as to make noises too great for readings.
Got reliable readings on turn of tide, about 12:30 P.M.

Found A battery low voltage and on test found

1 cell 1.25 V.	4 cells 4.80	7 cells 3.80 V
2 cells 2.50	5 " 4.50	8 " 4.90 "
3 " 3.75	6 " 4.20	9 " 5.80 "
		10 " 6.60 "

proving that cells 5, 6 and 7 were reversed.

Cut these out and with cells 1, 2, 3, 4, 8, 9, 10 in circuit got 9 volts.

During turn of tide made tests of mica diaphragms with iron centers against standard Bell diaphragms.

(50)

Transmitter #4 (Small Dummy Bell)
Receiver #2 (Bell Receiver with Tube)
Distance about 100 yards.

A Regular Bell Diaphragm.
Heard to 52

B Mica Diaphragm .005 thick with iron disc 3/4" diam x .005" on center. Disc on opposite side of diaphragm from magnets.
Heard to 60

Attempted to reverse ~~so that~~ disc moved to on magnet side of diaphragm but disc pulled away from diaphragm.

C = Mica diaphragm .0055" thick. Iron disc .013" x 3/4". Disc on opposite side of diaphragm from magneto.
Heard to 54.

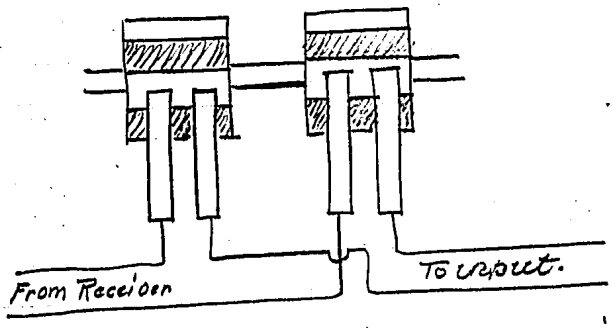
Attempted to take reading with disc on same side of diaphragm as magneto. The magneto siezed the disc.

D = Mica diaphragm .011" thick with soft iron disc .005" thick x 3/4" diameter. Disc on opposite side of diaphragm from magneto.
Heard to 20

By this time the tide had turned and was running so quickly as to make reading impossible from noise made with receivers.

Tried out new break wheel to see if less noisy than former.

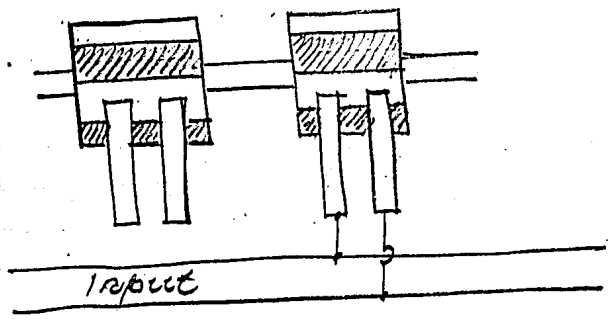
1st connected in usual manner.



Found loud singing periodic note whose pitch was not varied by changeing speed of motor.

Found that when brushes were left on insulated bar, that is when input was open had same singing noise when motor was stopped.

Changed to following connection so that input would not be open —



Break still noisy but now the pitch of note varied with speed of the motor.

This noise is too great to permit break being used in input circuit.

5/15/17.

Arrived Cold Spring Harbor about 10 o'clock.

Spencer had Ted Nilson to call him up at 11 am. Called up and reported clutch trouble.

Decided to take Engineer from Cold Spring Harbor to run engine until we got through Hell Gate and into the Upper Bay.

Left about Noon.

Had difficulty with clutch in getting away. If the reverse was adjusted ~~tight~~ enough to hold the forward moved hard.

Finally adjusted so that the reverse was loose. Went well until off Matinicock Point when engine began showing trouble which continued until we got off Light House at Execution Rocks. Here she stopped dead and we had to anchor to avoid being blown on the rocks. (N.W. Wind)

After about an hours work

finally got off here. Tried to make City Island. Engine had, stopping repeatedly. Finally refusing to run at all. About 8 PM. anchored 500 or 600 yds due S. of Stepping Stones Light in heavy below and heavy sea.

Nelson and Engineer examined engine and found water in #s 2, 3 & 4 cylinders.

Determined to run to City Island, Moss yard, in morning get new dry batteries and get in communication.

If engine works O.K. try and pull on through to Highlands. If engine shows up bad, phone Spencer & have her fixed up at City Island.

5/16/17.

Got engine straightened out and ran for City Island. Got 6 dry cells and sent Telegrams to Mr. Meakawore & Mr. Dawson and telephoned Mr. Spencer's office.

Ran O.K. until we got just above Manhattan Bridge. Played out and had to tie to a barge at Pier #40.

Found Spark Plugs dirty. Cleaned them. Got away about noon.

By compass laid course about 5 degrees east of South and made Sandy Hook point without trouble.

Stopped half way up the bay to clean spark plugs. Engine skipped and stopped half a dozen times, just getting us through the bridge at Highlands.

Tide carried us to mouth of Navesink River.

In trying to start engine, she back fired, and sheared

over

the buoy holding the starting yachts.

Rowed to Highlands and telephoned Drum to send Andy and launch to tow us in. He arrived about 9:15 and towed us to Red Bank by 10:30.

5/17/17.

Went in to see Irwin. Spencer had telephoned him to repair engine and clutch.

Got Dawson aboard. Discussed location of sound proof booth. Decided to use the small state room for the purpose. Measured this and Dawson sketched out Booth to fit. Sent him on to Orange to lay it out.

Got Irwin aboard to examine engine. He reported cylinder rings leaking, valves leaking, clutch dogs bent, ignition system poor, exhaust pipe needed replacement. Telephoned Buffalo Engine people who could not send man. Telephoned Spencer who will come down tomorrow. Telephonged Dry Dock to arrange to take her out.

Towed boat to dock. Planned to hire tripod to lift engines and have them out

for repair tomorrow.

5/18/19.

Irwin & Andy early on job. Got engines disconnected from oil pipes etc and with frame & chain block hoisted up on deck. Found valves seated poorly. Little or no knock in bearings. Piston rings in good shape.

Spencer came about 1 P.M. and agreed to the work being done. Also agreed to sending her to Keyport to be hauled out and painted.

Left Dawson with boat and went to Orange to see about Booth and about small generating plant for charging the storage batteries.

5/19/17.

Found trouble with under-water box at Orange, top and sides warped so that the windows and top plate could not be fastened.

Got Ford truck and sent it with Taylor to McCabe Co. manufacturers to have straightened out.

Went over to Storage Battery to House Lighting Dept. Found that they had a small generating set (Delco) which moved for our purpose. They offered to loan it to us but Mr. E said buy it. Asked them to express it to Red Bank to arrive Tuesday or Wednesday.

From Nudd found that parts of Booth moved he shipped Monday and that Jeff and the carpenters moved he down Tuesday to put it together and on boat Wednesday.

Got back to Red Bank in afternoon.

5/20/17.

Got Kingsland on board to work on engine.

Andy ~~started~~ towing us to Keyport to be hauled out about 10:30 a.m.

Got along O.K. until between Point Comfort and Lowland, we ran aground. Got off in about 30 minutes.

Rain into rain storm between Point Comfort and Concoronk Point. Lasted only about 15 minutes.

Got to Keyport and anchored about 4:30 P.M.

Aeroplane ~~started out from~~ school. Sailed about 5 miles and dropped in sea. Was towed in.

Terry reports can not haul us out until Tuesday morning as he has the Oiking on ways which will not be off until ~~that~~ time.

5/21/17. - Monday

Went to Orange this morning. Found that Taylor had not got the iron box from McCabe but that he was going to inspect and see if O.K. in afternoon.

Had to get bottle of storage battery solution. Had to get car to catch 4:54 train. Boy just got bottle to me as I was stepping on car.

On arrival at Keyport, found that Irwin had been telephoning about material which had arrived.

5/22/17

Went to Red Bank to see Irwin about material. Found the cow hair felt and lumber for both there.

On arrival back at Keyport found that in drawing boat up on ways the rollers slipped off to port side so that the boat was jammed and when tide ran out could not go up or down.

Telephoned Mr. Spencer, Mr. Meadowcroft and to Irwin. Terry was apparently at sea and did not know what to do. Irwin came down about 9 P.M. Decided to draw her off at next high tide (about 9 P.M.) by reversing the ways and by line from bow to a large barge. Prepare ways tomorrow and put her on again Thursday morning. In this way she will not get off again until Saturday morning.

Also planned with Irwin to send felt and lumber over by

truck so ~~that~~ Mudd's men may work on both while boat is on ways and enroute to Newark.

Dawson went to Orange in afternoon.

Captain notified me this morning ~~that he~~ moved quit ~~that night~~, saying ~~that he saw~~ the boat was going to give trouble and he wanted to get away from it.

Settled with him as follows:

11 days wages @ 100 per mo	36.67
Advanced John	3.95
Advanced Cook	1.50
Telephone to Spencer	.35
	$42.47

Got following information from him

Name - Chas. A. Wilson
Address - 634 Lexington Ave, N.Y.C.
Age - 33
Nationality - Finland
1st Papers - About 6 yrs ago
2nd Papers - ~~not yet out~~.

I am glad ~~that~~ he quit.
Believe he is a good navigator

but he thought much more of the dignity of his job than of the work.

Terry got Yankee III floated about 8:45 P.M. Tied her alongside dock for the night.

5/23/17.

As sloop was coming in to ways close to us, anchored Yankee III off dock.

Cook did not return last night. Suspect he will quit with the Captain.

Saw Perry about pulling Yankee III out again. He planned examining his ways to day at low tide, and fixing them tomorrow and hauling us out tomorrow night. Got Drum on phone who got Perry to hurry up and pull us out tomorrow morning.

Arranged with Jim to bring the Tender down tomorrow morning. Hope the weather is good so he can make it all right.

Kingsland having trouble pulling off the fly wheel. Says he started it but she does not come farther.

Terry now tells me that he can not haul until tomorrow night. That he must float his sleds and get them on the tracks on high water tonight. Lower them & place on low tide tomorrow and pull us out at high tide tomorrow night.

Spencer came and saw boat that she was not damaged. Got him to go back by Red Bank to push Irwin up.

Talked to Kingsland about Captain's job. Spencer will go to Newark with us and if satisfied with Kingsland will take him at $100 per month.

Telephoned Mudd about the carpenters. Promised to send them down tomorrow morning.

5/24/17.

Trouble with pulling off fly wheel. Broke puller. Went over to Felton & Cherry - wagon works to have them make new one. They loaned me one which was little too small. Had them make attachment so it would draw while from two holes already in it.

Telephoned Irwin. He could not come out this morning but would try this afternoon.

1 P.M. Carpenters have not yet arrived.

1:30 P.M. Carpenters arrived. Began work on booth

Saw Terry who tells me that he can not pull out at night.

Got fly wheel off O.K. Pulled key with it and stuck the whole way.

Telephoned Irwin size of key 1/2 x 1/2 x 5 3/8 to have new one made.

5/25/17.

Irwin came over early - 6 a.m.
Got fly wheel on with starting
ratchet pinion & key.
Repaired engine.
Brought over spare perfex plug.
Got engine started.
Adjusted clutch so that would
lock forward and backward.
Bound slightly on back however
and had to loosen up.
Ferry would not haul us on
account high N.W. wind.
Told Irwin that unless we could
go to Newark Sunday morning
he could not haul us at all.
Kingsland wants 3/8 x 16 bottoming
tap and reamer. Could not find
in Keyport (4 stores). Tried twice
to telephone Irwin for it but he
did not answer phone.
Got 3 set Autions & Batteries
aboard from Andy's boat.
Went to Orange to get bottoming
tap & money and was beginning
to run short.

New transmitter not finished.
"Miniature Submarine" not finished

5/26/17.

Caught early train (8:27) back. Saw Terry who could not promise to get us off Wayo before Tuesday or Wednesday if we went on. Told him we could not go on as we had to get off Sunday. He promised to hold Wayo for us on notice any time we could come back.

Telephoned Irwin several times about clutch. Had band made to go around & draw up on it to prevent breaks spreading. Just too late to clear housing.

Telephoned Standard Oil Co at Matawan for gasoline.

Could not tell when it would come. At last, about 4:30 telephoned and it had not started yet. Consulted and after trying garage, finally by hauling in trailer, for cars, finally got from Keyport Yacht Club.

Rope, oil dressing from Irwin's arrived about 8:30 PM. So we

hauled out to anchor ready to get away in the morning.

Spencer came at noon. Saw situation. Talked with Irwin over phone.

Determined to hold to plan to make Newark by leaving early Sunday morning & take Andy's boat along for safety.

5/27/17.

Up early. Got away from Keyport 8-8:30. Engine blew out gaskets in about a mile and Andy took us in tow alongside.

Got engine running again but blew out another gasket.

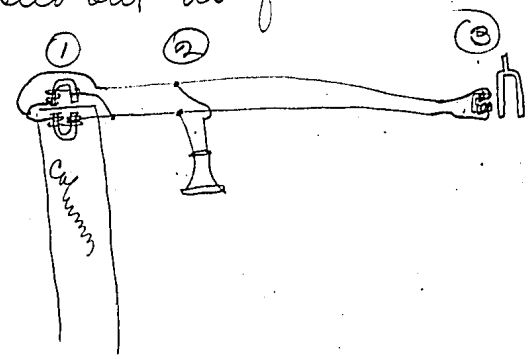
Made across the Raritan Bay and up Arthur Kill on tow O.K. Past 3 bridges. Ran aground just before 4th. Got engine going to pull out.

Long waits at Turnpike & P.R.R. bridges.

8/4/17.

Hanley brought down and set up resonance column.

Tested out as follows



1 = Balanced Receiver (Regular Diaphragm)
2 = Bell Receiver to compare with column
3 = Magneto phone 290 fork & watch case receiver, fork tapped by hand.

1

Tested Column against Bell Receiver and adjusted until when turned to 23.6 (in column) the sound of fork could not be heard in receiver and could be distinctly heard in ear tubes. Proving O.K.

8/4/17

(2)

Then replaced #3 with resonator #3 and used B♭ Bell (#3) as transmitter.

Could be heard distinctly in (2) (Bell Phone) but could not be tuned for and heard in tube.

(3)

Same as #2 but used E♭ Bell (Transmitter #2) in place of B♭ Bell.

Could tune for in tube and hear at 14.5 very faintly. Could hear loud in Bell Telephone (2).

(4)

Replaced (3) (Resonator #3) with Bell Telephone and placed 8" from E♭ Bell IN-AIR.

Could be heard plainly in Bell Telephone.

Could hear note faintly at 24½

By tuning could hear tap of clapper at 12-18-24-36.

Reason that fork could be heard better than bell probably because the fork gives a pure musical note while a bell gives a stroke with a series of non multiple overtones and can not be tuned for as readily.

Wish we knew what a submarine really sounded like - whether the gyroscope - the commutator - shaft vibration or the propeller made the most noise so that we could go after the right one and try and get it.

8/5/17.

Sunday.

I Hanley went to Orange last night to get adapter ring to fit large, movable coil receiver to resonance tube and returned this afternoon.

We will go out in Bay tomorrow and try out.

8/6/17.

Got provisions & ice aboard.

Ran out in Bay and anchored about 1 mile due east of Sandy Hook light. (Position indicated by Mr. Edison when down).

Rigged up the crab to anchor horn on bottom so as to avoid rope sounds.

Weather overcast. Slight breeze from S. E. Increasing.

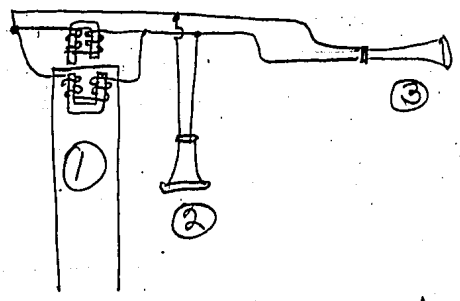
Preliminary

1. Tested out resonance tube with tuning fork O.K.
2. Tested horn circuit to tube with E♭ Bell. Could not tune for. (Confirms previous experiments)
3. Used 290~ fork, touching horn [illegible]

8/6/17

to test horn circuit. Proved OK and when turned to 23.6 louder than Bell Telephone.

Used Booth with top off. No Boat noises interfere.



1 = Resonance tube with balanced receivers.
2 = Bell Receiver
3 = Horn Receiver #2.
Transmitter = Bell Eb #2.

(5)

Anchored #3 about 30 yds from Rampart
Sounded Transmitter #3 about 30 yds away. Could not hear

either with resonator #2 or
with column #1.

A Battery OK - 1.3 amp
B " 130 volts. ee

(6)

Above experiment being a failure connected up audions. With Bell at about 100 yds could hear on -

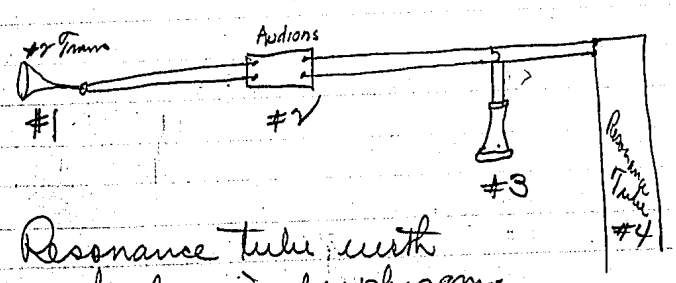
Low to 26
High to 38

This is low sensitivity and the audions show too much crackle noises, will have to be looked after.

~~Wind up or blowing white caps~~

(7)

Then connected the resonance tube with audions, as shown



Resonance tube with balanced diaphragm.

Used Ed Bell as transmitter.
Could hear to 32-38 with
audions and receiver.
Could not distinguish with resonance
tube at any tuning.
The popping & crackling noises
which were prominent in
receiver were more prominent
in resonance tube and could not
be tuned out.

(8)

Tested to find whether these
crackles were in audions or
in input circuit. Found that
audions worked OK and crackles
were in input circuit.

(9)

Used Bell Receiver in place of
#1 and tested resonance tube
against receiver. Used 920~
tuning fork to excite.
Sound louder in tube than in
receivers but could not be tuned
out. Slightly louder at 13.6 - 20.5

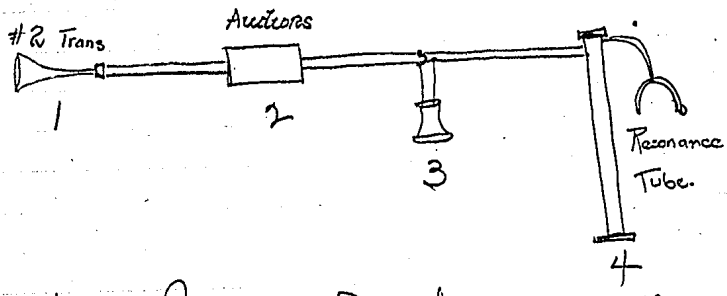
and 26. — This seems to show that the tube can tune out low sounds but not those amplified by the audions.

Took in Receiver #1 and found one wire broken.
This accounts for crackles and for lack of sensitiveness.

8/7/17.

Weather beautiful. Slight breeze making just a ripple on the sea.

As results yesterday were false, due to broken wire from receiver to input, duplicated these experiments to make exact.



Used Balanced Diaphragm on resonance tube
Used E^b Bell (#2 Transmitter) for signals.
Anchored this about 30 yds from boat on tripod.

(10)

Distance 100 yards. Could hear with audiono

Low 60
High 60

Audiono working fine. On account of smooth sea, very little noise – no crackles as yesterday. Demo as sensative as on first tests.

(11)

Then listened in with resonance tube H. Sound not as loud as with resonner.

Tried tuning out sound and could not. Practically as loud at all lengths of air column. Sound of bell just a little clearer at 22. which about corresponds to fundimental note of bell.

(12)

Distance 600 yards

Low to 60
High to 60

(13)

Could hear at all points on resonance tube. Could not tune out. Trifle clearer at 22.

(14)

Distance 1000 yards. Readings not clear on account of boats running around. Two government boats and about a dozen small fishing launches churning around. Boat also swung and tightened up on lead wire and made noisy.

Had to get train for Orange so left at 4:30.

During boats running around Hanley fancied he turned out well once but not sure.

Will go out in middle of bay where fewer boats are on next attempt.

8/8/17.

Orders from Mr. E to proceed to Sagg Harbor. Telegraphed Dawson at 9 am to get water, gasoline & provisions on board. Took 11 train. Telegram not delivered until after my arrival about 1:20.

Got on gasoline, &c, provisions left at P.M.

This morning Dawson & Hanley had watered & charged batteries.

8/9/17.

Got away from Gravesend Bay at 4:50 a.m. Bucked tide to Hell Gate. Water here remarkably quiet probably because almost dead low tide.

Ran west to New Haven. Got in about 5 P.M. Timed speed of boat at Execution Rocks. Just under 8 knots per hour.

Went to Naval Base at New London to find about gasoline. Informed ~~that~~ could not get any there but could at second slip "this side" of bridge. Could not locate this slip but was directed to Standard Oil dock on other side of bridge.

Steering cable overlapped on drum and had some trouble getting to dock. Then more trouble getting gas. Took on 50 gal & anchored outside for night.

8/10/17.

Engine hard to start. Got away at 8:20 am.
Sea a little rougher than previous day - cross sea with white caps.

Made nets about 9:40. Patrol boat directed us through between "red and white buoys" as I understood though he probably said "red or white gas buoys".

Sun was directly in front so as there were white buoys to port we ran between red gas buoy & white buoy. Second guard ship called us down for not running between red & white gas buoys which were very plain from his side, with the sun but we did not see against the sun.

Made Pag Harbor about 1 PM. Went to Station & telegraphed and got information about Bluff

Found Mr. Pleasants at Bless Co. who extended every courtesy, proved change that we had established base.

Met Mr. Miserau who first said probably would have no torpedoes Saturday to fire but on telephoning found they were coming and would be fired.

Arranged to test tomorrow and listen in on their firing.

8/11/17.

Up at 6. Saw Miscraw who said he moved gave no pilot out to holing grounds in time to get there & set up. Left Bay Harbor, about 9:00. Got to 1st scow on course 4000 yds from firing point and anchored 200 yds to right.

These distances accurately determined by scow and by stakes.

Put out #2 Receiver on tripod in 30 ft water as the sea was little rough with occasional white caps.

(15)

Test to bear Torpedo on Bliss Co. proving ground.

Receiver #2 (Bell phone with horn) on tripod in 30 ft of water pointed at right angles to course of torpedo, 4000 yds from firing point, 200 yds off course.

Heard the 1st Torpedo plainly and from evidence, the whole length of course. It sounds more like a car running around a curve than anything I know. There is not a single note but a lot or series of notes mixed together. If one is more prominent than the others it seems to be A = 435 N per second. Pennant not Tripod

(105)

Note. Launches running after torpedo mask the sound.
Must try and get tests where launches are a greater distance away.

Found part of noise from input wire on coil near a battery which may have been gassing.
Believe we should run this input the whole way in lead covered cable. We need special reel to hold this.
Have one made in Lab

(Torpedo stopped)

2nd Torpedo. Did not hear when they said it was fired but heard a series of crashes & bangs like explosions. Then heard it later but not plain & heard a launch with it. Heard it only a little time when it stopped short.

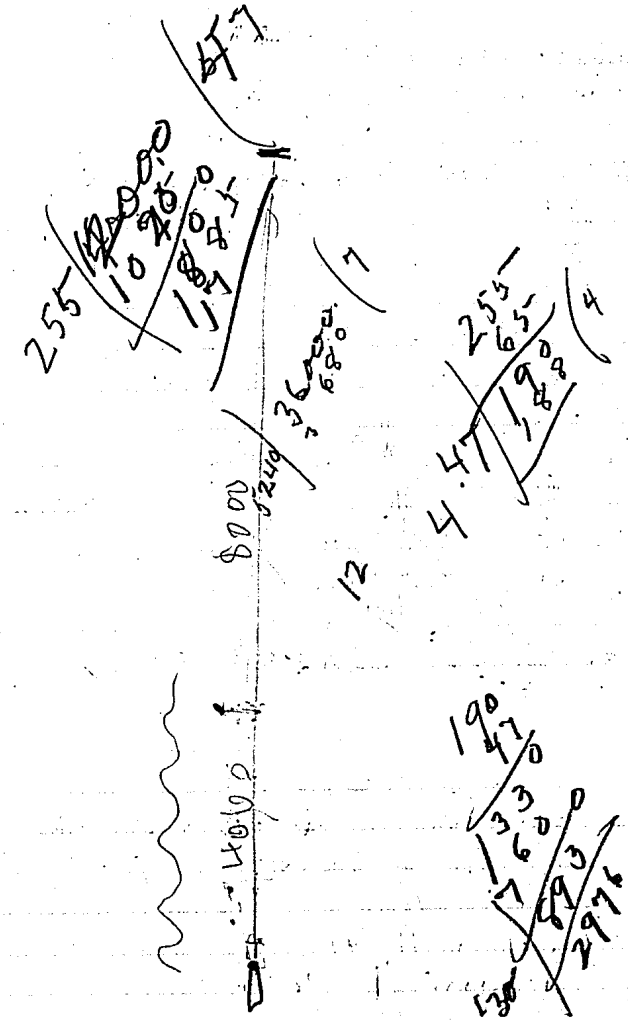
3d Torpedo – Could hear only when passing. Then very loud estimate heard only about 2000 yards on either side of horn.
Found batteries low – incapable of giving 1.3 amp to 1st audion & all audions low.
2 launches at 200 & 500 yards. Masked torpedo for awhile.

4th Torpedo. New Batteries ok. Audions. Somewhat noisy – some crackles.
1 min 45 sec after firing – first heard.
3 min. Very loud. High pitched distinctive note.

3 min	40 sec	seemed loudest.
4 "	30 "	loud, diminished
5 "	00 "	loud, plain
5 "	30 "	hear
6 "	00 "	still hear.
6 "	40 "	& different noise hear launches plainer than Torpedo
7 min	30 sec	Hear launches only
8 "	"	" "
9 "	"	" "
10 "	"	" "

Then changed output around to pair of head receivers on deck ~~so that I~~ could see and hear too.

Launch went by. Could hear plainly for 1500 yds at right angles to horn.



No launches running up to 4000 yards ~~then~~ started.

5th Torpedo.
Listened to on deck.

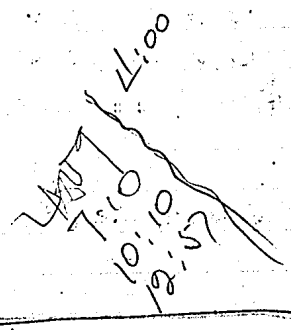
First heard after launching	1 min 5 sec
Loud at	2 " 30 "
Loudest	4 min.
Made 4000 yds in	4 " 15 sec
Launch started.	4 " 40 sec
Torpedo loud	6 " 00 "
Heavy sound but believe launch is greatest part	6 " 30 "
Hit net	7 " 27 sec

Believe I could have heard full course except for launch.
This sound at 7:27 must have been 7000 yds.
Launch came back. At 2000 yds very loud.

Dawson took note of sound said two notes show $P \times C' = 384$ & 517 vibrations per second.

Straight No bogies in

1000 yds.
2000 ft.
3000 ft.
4000 ft.
Missed
complete
Report



Note

These torpedoes are fired for test with 60# air. Under service conditions are fired with 700# air. Hence the difference in velocity to 4000 yds and to 12,500 yds.

Naval Lt. gave following data on 2 shots of Saturday

1st		4th	
4000 yds	4:05	4000 yds	4:04
7000 "	6:58	7000 "	7:02
10000 "	10:07	10000 "	10:00
12500	13:42	12500	12:58

8/13/17.

Missed 5:25 P.M. train yesterday and left on 5:15 this morning arriving about 9:20.

Started saw Peasants of Bliss Co who stated they were testing torpedoes

Naval Lieutenant (did not get name, or grade, Ordnance Dept) warned me to be careful of two Japanese on the House Boat Cienfuegos, anchored at dock. They were suspected of being Japanese Naval Officers.

Started for testing grounds soon as possible. Arrived 11:50 at Cienfuegos.

Went aboard. Found they would fire until 4:30 P.M.

Order
500 yds #18 & #19 Red & Black
Rubber covered wire. Jerry can
furnish sample. Express care
E. M. Bliss Company.

Write Mr. E
1. Launching pressure here & battle conditions
2. Lead In wires shorted.
3. Range Difference.
4. Trouble with audion circuit in addition to lead in wires.

Get Tape

(16)

Lowered #2 Receiver. On test proved defective. Could not hear a torpedo which had been fired, a launch or a bell.

Took in and tested out & found short circuited and that this short circuit was in the lead in wire.

This caused us to miss torpedoes #'s 8, 9, 10, 11, 12. which were fired.

Took off #2 transmitter. Some moisture around tape on top but chatterton compound seems intact and seems to have protected joint. Connected up new transmitter (& wire) Audion circuit very noisy even when short circuited.

Do late we will have to go in and telegraph. Nice test tomorrow and get ready for torpedoes.

C111

8/14/17.

Left 5:45 for testing ground to get ready.

Put out .002 wire transmitter on tripod. Tested with buz. Could hear right over but could not hear at 500 yds. Circuit very noisy.

Looked Audion circuit over. Found two loose connections, one on A battery, the other at B. battery switch.

Then tested out. Circuit quiet on disconnecting transmitter & substituting Bee Receiver. Circuit quiet on testing with new .002 wire receiver out on tripod.

Tested with #2 (E' Bee). Could hear to 60 at 100 yds. Could not hear at 700 yds at all.

14.2

.015) 4.200 (280
80
120
120
0

.048) 13.700 (285
96
110
384
260

Then disconnected underwater receiver & connected Bell receiver. Audion circuit seems sensative. Clock 8 ft away very loud on low.

Measured resistance under water receiver. Bridge returned to Lab so had to use ammeter-voltmeter method.

Current 13.7 volts - .08 amp
= .181 ohms.

Measured #7 receiver out of water
= 4.2 volts - .050 amp
= 84 ohms.

Then again measured resistance of new receiver, which had been withdrawn from water and were allowed to dry:
.015 amp 4.2 volts = 280 ohm
.048 amp 13.7 " = 285 "

.058) 13.7 (236
116
210
174
360

.065) 13.7 (211
130
700
650
50

.070) 13.7 (196
136
90

.090) 13.7 (152

.100) 13.7 (137

Again let new receiver & wire into water.

Reading	①	.058 amps	13.7 volts	=	236 ohms
"	②	.065 "	13.7 volts	=	211 ohms
"	③	.070 "	13.7 "	=	196 "
"	④	.090 "	13.7 "	=	152 "
"	⑤	.100 "	13.7 "	=	137 "

Then left during lunch.

"	⑥	.000 "	13.7 "	=	∞ "

This means ~~that the~~ circuit is open somewhere and has been leaking.

Cut wire loose from receiver. Wire showed continuous continuity but test under water showed break down of red lead — ~~that~~ is ~~that~~ the red lead was grounded

Test of receiver alone showed 150 ohms resistance.

Puzzled as to where the break was.

Then tested out lead covered wire as this is the only continuous good wire we now have.
This tested O.K. in continuity and no grounds.

Connected lead covered wire to receiver. Circuit showed OPEN.

Disconnected lead covered wire from receiver. Fire circuit O.K. Receiver circuit OPEN.

It is evident that an intermittent open circuit in this receiver has been deceiving us all day.

Then used #2 Receiver in place of new receiver. Wired temporarily to lead covered wire. Tests out O.K. Wired permanently with water proof joints. Tests O.K.

No torpedo tests made today by Bliss Co.

8/15/17.

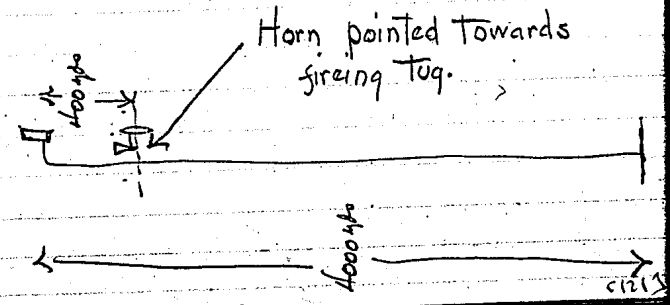
New course in Noyack Bay.
In this course the torpedo is fired at right angles to course, has to turn and make course.

(17)

Set out #2 receiver on tripod at 400 yards.
Had no time to test as they were ready to fire.
Heard torpedo immediately it struck water unmistakeably.

When off horn could not stand tubes to ears. Deafening.

Could hear about 1½ minutes.
Launches interfered.



These are special torpedoes which leave very little wake.

We could not see them more than 300 or 400 yds away.

Wake of ordinary torpedo due to smoke of superheat of air.

NEED – BETTER LEAD IN CABLE. and reel to handle.

Also better tripod and means of launching.

Went in to tug to see Minerva

He promised to keep launches from running while torpedo was running.

Staked off accurately 1000, 2000, 3000 yd. Range buoys for us.

Found from him that the two propellers on the torpedoes run at two different speeds. Hence the screech of not one but two musical notes before recorded.

(18)

Range 400 yards.
Heard torpedo instant struck water.
Could hear 1 min 25 sec above other noises – which were coming from tug.

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(18)

Range 400 yards.
Heard torpedo instant struck water.
Could hear 1 min 25 sec above other noises – which were coming from tug.

They fired a small torpedo
here before we were ready.
Absolutely invisible.

(19) (accurate)

Moved to 1000 yards.
Heard 1 second
Lowest 1 min 10 sec.
Heard N. 30 sec
Made 4000 yds in 4 min 45 sec

No barrels running.
Only none of waves
some white caps.

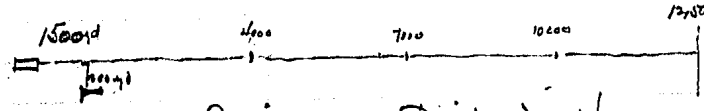
(20)

Range 1000 yards. (accurate)
Wind Rising. Sea getting Rough. Numerous
White Caps.
Signalled all boats in. Before
we got tripod set again, fired
last shot for day

~~Last~~ next Report

8/16/17.

On Gardiners Bay Range. (Long Range)
Anchored at estimated 1500 yds from fireing tug, 200 yds off course.



Used #2 Reciver on Tripod. Horn pointed at fireing tug. Lead covered input wire.
This is too short and does not lie on bottom.

(21)

Second shot of day. Not quite ready. I heard at when shot and thought I heard about 500 yds past 4000 yd scow.

(22)

Same conditions as 21 but I did not know when shot was fired and yelled to Dawson when I heard who took time interval

Missed 3d shot. Cable got tight due to not enough lead covered cable & had to reset horn.

Missed ~~4th~~ Shot
Moving

Time to hear. 2 2/5 seconds
Loudest. 1 min 55 sec
Passed 4000 yds. 4 " 25 2/5 sec
Can not hear. 5 " 35 "
Passed 7000 yds. 7 " 57 "
Passed 10,000 yds.
Passed 12,500 yds.

---

(23)

Same as 22. as torpedo started.
Launch about 3000 yds away but stopped.
Time to hear 7 4/5 sec
Loudest 1 min 58 sec
4000 yds 4 min 10 3/5 sec
Can hear to 5 min 45 sec
7000 yds
10,000 yds 10-32
12,500 yds

---

(24)

Same as 23 but 2000 yds.
about 400 yds off course
Time to hear 5 3/5 seconds
Loudest 2 min 21 sec
4000 yds 4 " 4 "
Stop hearing 6 " 35 "
7000 7 " 05 3/5

10,000 - 10 min 10 4/5 sec
12,500 -
(no launches running

(25)

Same as 24. Except that tug started up & made noise so could not hear torpedo as far

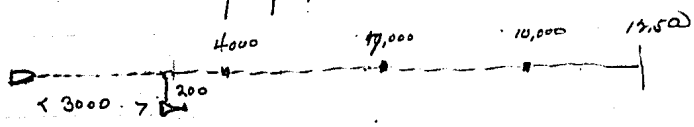
I hear	9 1/5 sec		
Lost	2 min 40 4/5 sec		
4000 yds	4 "	8 sec	
Can't hear	5 "	7 "	(noise of tug)
7000 yds	7 "	5 3/5 "	
10,000 "	10 "	10 4/5 "	

(26)

~~Same as 25~~
~~I hear~~

[1515]

8/17/17.



Set up as above same as yesterday using #2 Pioneer with lead covered input. Launched on tripod from boom.

Day threatening - rain, thunder & heavy clouds. Wind in gusts rather than puff & steady.

(26)

Distance 3000 yards

Time to hear	15 sec	
Loudest	3 min	0 sec.
4000 yds	4 "	18 "
7000 "	7 "	22 "
10000 "	10 "	37 "

Splash as run to surface or explosion at about 3000 yards.

Dug & launch running. Could not tell when ceased to hear.

Wide angle Horn to pick up from various directions.

(27)

Same as 26
High wind & white caps here

Hear	17 sec.	
Loudest	2 min.	52 sec
4000 yd	3 "	45 sec
Launch Started	5 "	05 sec

interrupting when sound lost

7000 yds	6 min	25 sec.

Could not see 10,000 or 12,500

(28)

Same as (27)
Wind quieted down. A beat, slow speed engine running.

Hear		25 sec
Loudest	3 min	38 "
4000 yds	3 "	47 "
Launch Started	5	25

Can't distinguish from launch 6 - 25

7,000	7 - 42
10,000	10 - 53
12,500	13 - 55

(29)

Same as 28. Tube launches running at first x current noisy prevented early hearing

Hear	37 sec	
Loudest	3 min	- 15 sec
4000 yds	3 "	- 55 "
Cant Hear	6 "	29 sec
7000 yds	6 "	50 "
10,000 "	10 "	00 "

Torpedo off course - 200 yds at 4000

(30)

Same as 29 but 4000 yds.

Distance 4000 yds

Hear at	1 min	26 sec
Loudest	3 "	50 "
4000 "	4 "	5 "
Lost Hear	5 "	29 "
70000	6 "	05 "
10000	10 "	05 "

Note Against sun impossible to see wake of torpedo.

(31)

Same as 30
Sea rather quiet. Gentle wind.
Distance 4000 yards.

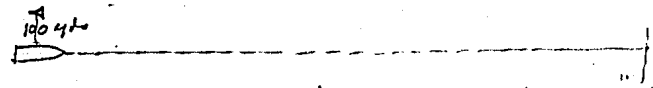
Heard	1 min	8 sec.
Loudest	4 min	
4000 yds	4 "	18 "

Launch started at 400 yds & masked here

7,000 "	7 "	07 "
10,000 "	10 "	07 "
12,500 "	13 "	3 "

~~(32)~~
~~Same as 31~~

8/18/17.
Weather Rough. High Wind.
Rollers and White Caps.



Set up beside the torpedo firing boat in attempt to get distance can hear torpedo.

Used Receiver #2 Launched on tripod, lead covered input cable.

(32)

Wind getting worse.
2 launches running at 2000 & 3000 yds. So much noise that it is impossible to distinguish torpedo except when "loud" – that is approximately 1500 - 2000 yds.
Could not hear – indefinite.
7000 yds in 6 min 22 sec

290 = 23.9
435 = 13.2

(33)

Same as 32. Wind getting stronger.
No launches running.
Could not hear about 3 min 45 sec
4000 yds 4" 05"
7000 " 6" 45"
10,000 " 9" 55"
Believe safe to say can hear 3000 yds.

(34)

Then connected up the resonance tube to audion circuit. High Wind
Launch in so could not separate
Response at 13.5"
Could not determine whether Launch or Torpedo made this note

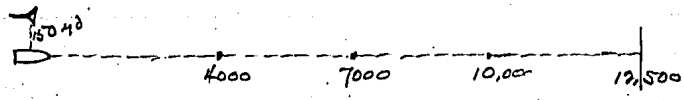
(35)

Same as 34.
Hanley heard to 5 min 20 sec (5000 yds) with tube. Firing tug then left grounds and interfered. (Embalame)
Heard last at 6.2"

5/13/640

8/20/17

Repeat Saturdays experiment as conclusions then were indefinite.



Wind moderate small white caps
#2 Receiver mounted on tripod used.
Resonance column and head telephones in parallel on output circuit
Receivers are high resistance, column lower so ~~that~~ they shunt the receivers.

(36)

Receivers hear	3 min.
Tube Lost	3 min
7000 yds	7-23 ⅝

Tube has balanced diaphragm and tuned to 6.1" air column.

Dawson listened in to get torpedo note. Says there are several. of which the lowest and most prominent is E' - or 640 vibrations per second.

16 | 6.4.0
4.0

Hanley was able to time out launch running just previous to torpedo. Dawson confirmed this.
Hanley reports that in his telephone receiver a variety of noises could be heard. The tube diminishes these noises and leaves the torpedo note at 6.1" tuning undiminished.

(37)

Same as 36 to confirm but will use next point on tube.

Torpedo fired without bell being raised as we were not ready. Sounds very weak in earpieces

Ear pieces Port	45 sec
Launch started	1 min 54 sec.
Column gone	4 min 20 sec

Could not hear at 6.1" tuning
Heard at 12.1" tuning
Most prominent note E^b about 600 vibrations.
Hanley says not as loud as before
Audions down so that filament C = 1.2 in place

(38)

Same as 37
Wind now up. Numerous white caps on bay.
Brought audiometer back to 1.3 filament current.

Ear receivers lost at 1mm 30 sec.
Tube lost 4" 7 sec.
4,000 yd 4mm 12 sec.

Resonance tubes hear at 12.1 turning
Dawson says note was different from before & could not easily distinguish. Sounded G = 384.
Heard very faint in telephone ear pieces.

Wind too high here so Emblane (torpedo firing tug) stopped firing and put back for Sag Harbor.

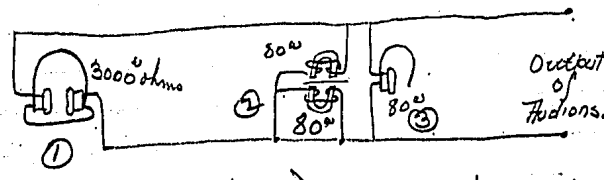
On pulling in horn, found one of the ropes fouled so that the tripod was upset. Think this occurred from roll of boat between the 36 & 37th experiments.

8/21/17

Hanley left last night so Dawson and I had to take the resonance tube and learn to use it.

The water supply at first would not drive the water high enough. This proved due to air in the syphon tube.

(39)



Preliminary for Dawson to get get used to Resonance tube.

Used #1 Receiver on tripod.
Read covered input.
Resonance tube which balanced diaphragm.
Could hear torpedo with 1 telephone ear pieces for 9 min 11½ sec.

CISI

Torpedo made 4000 yards in. 4 min 8 2/5 sec.
Dawson turned to 2 pitches at 10" x 7".

(39)

Same as 38
with telephone ear pieces to 3 min 27 sec.
Dawson say heard at 6.1" – 4 min
at 9.9" – 7 min.

Note was E = 320.
This was a "cold" torpedo –
superheater did not work.
Made only 4000 - 5000 yards.
Could see it creeping along.

(40)

Same as 39 but removed ①
telephone ear pieces.

Dawson reports at 6.1" heard 3 min
" 8.2 " 5 "
" 10.1 " 7 "

at 6 min a launch started up.

Went over to Ambrose and was informed that the torpedo propellers make 1300 R.P.M. and have 4 blades

$\frac{\times 4 \times 1300}{60} = 87$ vibrations per second. The noise of a torpedo certainly does not sound this low a note.

Launches up to #11 make 400 R.P.M. #11 makes 600 R.P.M.

(41)

Same as 39.

Auditors have a high pitched "whistle" Hear with telephone ear pieces to 1 min 70 yds

Torpedo made 4000 yds 4 min 21 2/5 sec
" " 7000 " 7 " 25 3/5 "
" " 10000 " 10 " 37 "

Dawson started resonance tube at 50 and worked up. Heard at 50 & 34 loudest. Stopped at 38 and thought he heard torpedo but sound did not diminish. Probably jump on

Enriblane

(42)

Exchanged places with Dawson.
I took resonance column.
Water moved not rise above 56".

Water moves up and down in column so slowly it is practically useless. Torpedo has gone before you can tune for it.
Water takes 4 min to go from 6 to 56.

(43)

Dawson at Resonance Tube.
Hear torpedo with head telephones

	1 min	37 sec.
to		
Torpedo made 4000 yds	4 "	13½ "
Launch started	5 "	0 "
Torpedo made 7000 yds	7 "	14 "
" " 10000 "	10 "	19½ "

Dawson heard to 17 for 4 min.
Then turned to 32 – Heard too long.
Sound did not die away.
Believes he can hear torpedo at any place on column.

(44) same as 43

Dawson at Resonance Tube.
With telephone ear pieces hear torpedo 1 min 56 sec
Torpedo made 4000 yds - 4 min 7 sec.
" " 7000 " 7 " 03 "
Dawson heard torpedo but sound of pump on Emblame became more prominent at 17' turning.

Is unable to tune so that torpedo sounds loud and other noises are cut out.

(45)

Same as 44 except K. at tube resonance

Note of torpedo very close to 300 vibrations per second.
When close could hear this note prominently.
Tube seemed to tune to this at 12.1".
Other popping & crackling noises coming in excited resonance tube to give same note.

8/21/17

Storm last night. High wind this morning – too high for Emblaine to go out.

I went to Orange to see about

1. Cable which came wrong.
2. New Receiver Heads
3. Mr. C's coming to Sag. Harbor.
4. Cash.

No readings to day

8/22/17.

Mr. E. arrived on Dashem about 8:30.
Emblane did not go out but we went to Noyack Bay to test audions against Moores new microphone.

[illegible]

[illegible]

Old Short Range (Noyack Bay)
Connected up Moores new microphone transmitter. With batteries alone (without audions) bell could not be heard.

Then connected up audions so that could use Moores Microphone and #2 Receiver alternately.

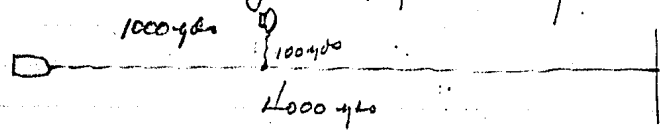
Moores Microphone whistled and chirruped very badly. Also absolutely insensitive so that a bell ringing on Stern could not be heard.

Could hear launches 1000 to 2000 yds away with regular #2 Receiver.

Moore then took microphone out of water. Water ran out of equalizing tube showing that this had leaked and admitted air. Readjusted diaphragm less sensitive.

On putting back in water, whistling stopped. Microphone very sensitive but poor in quality. Launch & torpedo sound nearly same.

Moore's Microphone suspended from side of boat as input.
Short Range - Nyack Bay -.



Could hear torpedo from time fired until reached 4000 yds.
The sound is not clear - there is frying and excess of wave noises mixed with the torpedo.

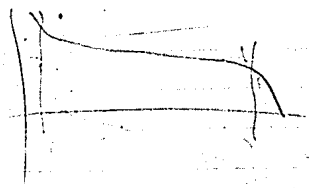
Torpedo also has only low note. Does not have high notes heard with #2 Receiver.

Moore's Microphone is very sensative but has very poor quality - fuzzy badly and has lot of noises.

Is 30 times as sensative as #2 Receiver but poor quality

(1)

1 - 49 3/5 sec
4000 - 4 min 13 1/5 sec
7000 - 7 - 14 1/5
10,000 - 10 - 21
12500 - 13 - 15



(2)

2 - 50 sec
4000 - 4 - 20
7000 - 7 - 15
10,000 - 10 - 17

(3)

2 - 38 3/5
4000 - 4 - 11 3/5
7,000 7 - 9 1/5
10,000
12,500

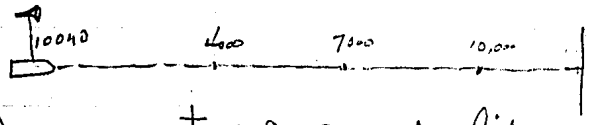
8/24/17.

On Long Range in Gardner's Bay.

Launched #2 Reaver with lead connected input.

Jerry listened in to confirm previous records by Dawson & self.

(47)



Jerry says torpedo sounds like street car around curve - screech as described.

Pump on Emblane 100 yds makes considerable noise.

Jerry listened in.

Airdrome on "Low"

Jerry ceases to hear		1 min	49 3/5 sec.
Torpedo makes	4000 yds	4 "	13 1/5 "
" "	7,000 "	7 "	14 1/5 "
" "	10,000 "	10 "	21 "
" "	12,500 "	13 "	15 "

(119)

(47)

256
124
384

Dawson took
Jerry sent here 2-00.
Dawson " " 4-25
4000 " - 4-09 4/5

(48)

Same as 47 except Audions on "High".

Jerry ceased to hear torpedo	2 min	50 sec
Torpedo made 4000 yds	4.	20 "
" " 7000 "	7"	15 "
" " 10000 "	10 "	17 "

(49)

Same as 48 but tender was run around Rampart to make noise

Jerry ceased to hear torpedo	2 min	28 2/5 sec.
Torpedo made 4,000 yds	4 "	11 3/5 "
" " 7,000 "	7.	9 1/5 "

Moore connected microphone to Audions. Made intermittent musical note like wireless. This was so loud as to obliterate other sounds characteristic of the source

(50)

Moore then connected up his microphone with pair of Bell Telephones to work as head

[171]

receivers.
Used this at same time as Audions, Dawson listened to Audions, Jerry to Moores Microphone.

Jerry lost torpedo with microphone in 2 min
Dawson " " " audions 4 min - 25 sec.
Torpedo made 4000 yards 4" 09 4/5 sec

Dr 2 Memo no heard

Emblane left here.
Listened in on her leaving and could hear for 8 minutes, estimated at 2000 yards

Dawson listened in on 2 torpedoes with Moores Microphone - Said note was musical, clear and distinct and G = 384 vibrations

Best connection for Moores Microphone 3 Mdcells in series, 2 Bell Receivers to both ears connected in parallel.

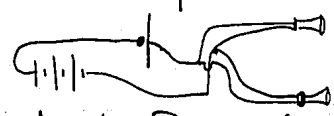
Think it would be a fine idea to use Moores Microphone with one or two audions.

Connected Bell telephones in series and found not nearly as good.

A-5

Test of Moores Microphone

Tender went out and Jerry lost in 250 yards.



#7 Microphone

Wind Sky W.

Sea choppy, few white caps. about 1/2 mi

B-6 only Kennedy Lanyards

Moore connected our horn on his microphone No 3, connected as above.

Rang Bell.. Characteristic sound with overtones. #7 Microphone

Made about 1000 yds when Jerry could not hear short funnel

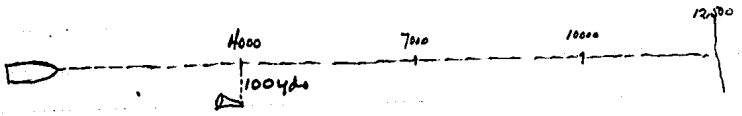
C-7.

Same as B-6 except Moore used #1 Microphone

As adjusted, this microphone varies periodically, getting louder, then softer.

Jerry ceased to hear at about 800 yards.

8/25/17.



Weather – Ideal at 8:30 am. Absolute Calm. Not a ripple

Missed first shot because not set up. If sea apparatus is designed with rings to hang and rods so as to hang in fixed direction, much time should be saved.

Could hear noise of SP192's pumps through air 2000 yds off. Could also hear with Moores microphone and could hear through megaphone.

Have never had such quiet & ideal conditions before.

Microphone gives trouble by intermittent buzzing. This seems due to intermittent contact at microphone points.

1st shot missed
2nd shot Microphone in bad condition
Jerry 1:56 ⅘
Loudest 3-36
Slow speed launch running 400 yds off stbd stern.
4000 = 4:04
Bliss launch started 4:10 – 100 yds away.
2nd Bliss launch running by at 100 yds.
Torpedo to right of course
7000 = 7:10
10,000

1st shot missed. Not Ready

(57)

2nd shot 9:10 am. microphone #2 with horn
Weather perfectly calm.
Moores #2 microphone pointed at Embane
Jerry 1st hears torpedo 1 min 56 ⅘ sec.
" says loudest 3 " 36 "
4,000 4 " 04 "
7,000 7 " 10 "
Microphone insensative and having intermittent buzzes
Slow speed launch running 400 yds off stern
Bliss launch started 4:10" – 100 yds away
2nd Bliss launch running 100 yds away
These launches prevented hearing torpedo further.
Torpedo ran to right of course about 40 yds at 4000

3d shot missed. Microphone out of order.
Jerry heard torpedo swimming at about 300 yds. Says note was C' = 512 ~.

Jerry heard 35 sec.

Jerry can hear Bliss launch with microphone at 3000 yds.

4th shot (52) 10:45am Still very calm

4th shot.
Same conditions as D.
Microphone in good order.
Jerry heard torpedo in 35 sec.
Loudest 3 min 55 sec
Heard to (3000 yds) 7' 17 sec

Jerry listened to our launch and could hear about 500 yds.

~~5th Shot missed record. Was not paying attention to bell. Jerry thought~~

5th shot missed record. Was not paying attention to bell.

5th shot

(53) same as E

11:37 am

Weather over cast. Fog to West.

Dead Calm

Jerry heard Torpedo	38 1/5 sec.
" " same loudest	3 min 55 sec
4000 yds	4 " 6 1/5 "
Jerry can't hear	5 " 48 1/5 "

Slow Launch towing torpedo back about 2000 yds away marked.

Torpedo about 20 yds to starboard.

(54) 6th Shot

Slow speed launch 1000 yds away towing boat.

12:04 P.M.

Dead Calm

Jerry hears	1 min 46 sec
" " loudest	6 " 50 sec
4000 yds	7 " 47 1/5 "
Jerry can hear	10 " 57 sec.

Cold shot going slow

(55)

12:49 P.M.
Dead Calm.
Fog to westward

Jerry hears torpedo — 55 1/5 sec.
Launch started from Emblane
4000 yds away just before
torpedo.
Jerry says loudest — 4 min 15 sec.
4000 yds — 4 " 27 "
Dawson says note is E' = 640 ~
Jerry cant hear — 6 min 56 3/5 sec.

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(56)

1:19 PM
Dead Calm
Clearing.

Jerry hears torpedo — 1 min 53 sec.
Jerry says loudest — 4 " 0 "
4000 yds — 4 " 8 2/5 "
Blis Launch ~~started~~ 100 yds away — 4 " 10 "
Jerry can hear its — 6 " 16 "

(57)

2:00 P.M.

Dead Calm

Jerry hears Torpedo #1 1min 25 sec.
" " " loudest 4" 0 "
" loses sound of torpedo 7" 05 ".

Moore listening in on his microphone #1 without horn
Moore hears Torpedo 1min 20 sec
" " " loudest 4" 00 .
" loses sound of torpedo 6 . 56 4/5"

Kennedy heard with ears under water, sound like wind through telegraph wires. Heard 3min after started or for 1000 yards

(58)

2:58 P.M.

Dead Calm

Kennedy hears Torpedo (#1) 1.53
" loses " 6'45
Moore hears torpedo (#1) 1-16 4/5
" " " loudest 4-20
" loses " 7-00

In 6:45 Bliss launch started 100 yards away. K. could not distinguish torpedo after this time.

Rampant 26t

			Pd for May.
Frank Kingsland	Capt	100.00	May 26 ✓
Peter Oslan	Sailor	55.00	June 8
James Carmody ✓	Steward	75	June 8 ✓
new man			Aug 23

6/11/17 Carmody advance 10.00
Less Milk .75

Market

John	3.95
Cook	1.50
Cook (Dawson)	5.00
John	1.00
John	2.00
Cook	20.00
John	2.00
John	1.00
Cook	20.10

John	$43.61
Cook	11.65

60

20
5
25

2)60
2.00
15
3 -
15
25
8.56
53.56
9.95
43.61
60

3.95
1.00
2.00
2.00
1.20
9.95

7)15 (2.14
14
10
10
56
30.

57/1 -	1/3 day	8.33
57/2 -	1 "	25.00

135